MATHEMATICAL AND COMPUTATIONAL SCIENCES
DIVISION COLLOQUIUM

PERTURBATION THEORY AND THE ENERGY SPECTRUM OF NORMAL FERMI SYSTEMS

Alexander Povzner

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Room 145, NIST North (820)
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ABSTRACT

The present work is concerned with an operator technique in steady-state perturbation theory for calculating the entire spectrum of the perturbed Hamiltonian H=L+T in the case in which the spectrum of L is strongly degenerate using the normal Fermi system as an example. The main idea of the proposed new perturbation method is to look for a transformation reducing the given operator to an operator commuting with L . In the considered example the principal result is a (formal) proof of the statement that an invertible operator S can be found to transform the Hamiltonian of a normal Fermi system H=L+T to the form SE=HS where the operator E depends only on occupation number operators of the undisturbed Hamiltonian L . We note that the obtained operator series do not contain the nonphysical terms with the powers of volume. The proof of the last statement does not use the diagram technique.

Alexander Povzner arrived in Gaithersburg a few months ago from Moscow. He is the former Head of the Mathematics Department at the Institute of Chemical Physics, USSR Academy of Sciences. He has been a major contributor to scattering theory and the Schroedinger equation, kinetic theory and the Boltzman equation, and he has developed new methods in Perturbation Theory. He is co-author of the 1991 Springer-Verlag monograph "Algebraic Methods in Nonlinear Perturbation Theory".

For further information, contact: Al Carasso (301) 975-2705.